



Short-term outdoor temperature change and emergency department visits for asthma among children: A case-crossover study

Author(s): Wasilevich EA, Rabito F, Lefante J, Johnson E
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Abstract:

Although weather changes are known to cause asthma symptoms, their impact on asthma-related health-care utilization is poorly understood. The objective of the present study was to determine the association between short-term outdoor temperature change and asthma-related emergency department (ED) visits among children 3-18 years of age in Detroit, Michigan, in 2000-2001. Descriptive analyses of patient and ED visit characteristics were performed. A case-crossover study utilizing time-stratified controls was conducted to determine the impact of maximum temperature change and change rate measured during 4-, 8-, 12-, and 24-hour periods. Multivariable conditional logistic regression demonstrated the relation between ED visits and temperature change after controlling for other weather and pollutant measures. There were 4,804 asthma-related ED visits during the study period, and they occurred most frequently in the fall and during morning hours. The case-crossover study showed a statistically significant inverse relation between ED visits and maximum 24-hour temperature change after adjustment for climatic factors (for temperature change, odds ratio Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.992, P Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.04; for temperature change rate, odds ratio 0.972, P Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.01). The association persisted after air pollutant measures were added to the model, although the association was not significant. Despite the finding that a greater 24-hour temperature change decreased the risk of asthma-related ED visits, the overall results suggested a negligible association with short-term temperature change.

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Resource Description

Exposure : ☐

weather or climate related pathway by which climate change affects health

Air Pollution, Meteorological Factors, Meteorological Factors, Meteorological Factors, Precipitation, Temperature

Air Pollution: Interaction with Temperature, Ozone, Particulate Matter, Other Air Pollution

Air Pollution (other): SO₂, NO₂

Temperature: Fluctuations

Climate Change and Human Health Literature Portal

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Respiratory Effect

Respiratory Effect: Asthma

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Children, Low Socioeconomic Status, Racial/Ethnic Subgroup

Other Racial/Ethnic Subgroup: African American

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified